

## CLAIMS

I/We claim:

1. A receiver that receives a plurality of inputs indicative of a sensed magnetic flux from a marker associated with a patient, said marker excited by an excitation source, said receiver comprising:

a correlation processor for analyzing said plurality of inputs in a coherent manner, said correlation processor acting on said plurality of inputs.

2. The receiver of Claim 1 wherein said plurality of inputs are acquired when said excitation source is inactive.

3. The receiver of Claim 1 further including a quadrature circuit.

4. The receiver of Claim 1 wherein said marker is excited a plurality of times by said excitation source and said plurality of inputs are averaged over said plurality of times.

5. The receiver of Claim 1 wherein said excitation source emits a triangular waveform to excite said marker.

6. A system for locating a marker associated with a patient comprising:  
an excitation source for emitting an exciting waveform during an excitation interval, said exciting waveform causing said marker to resonate;

a sensing coil that senses a magnetic flux from said resonating marker during a observation interval and outputs a receiver input; and

a receiver for analyzing said receiver input in a coherent manner.

7. The system of Claim 6 wherein said excitation source and said sensing coil repeats the emission of said exciting waveform and outputting of said receiver input for a

plurality of iterations, said receiver operative to average a plurality of receiver inputs over a plurality of said observation intervals from said plurality of iterations prior to coherent analysis.

8. The system of Claim 6 wherein said exciting waveform is a triangular waveform.

9. A system for locating a marker associated with a patient comprising:  
an excitation source for emitting an exciting waveform during an excitation interval, said exciting waveform causing said marker to resonate;  
a sensing array that includes a plurality of sensing coils that each sense a magnetic flux from said resonating marker during a observation interval and outputs a plurality of receiver inputs; and  
a receiver for analyzing said plurality of receiver inputs in a coherent manner.

10. The system of Claim 9 wherein said excitation source and said sensing coil repeat the emission of said exciting waveform and outputting of said plurality of receiver inputs for a plurality of iterations, said receiver operative to average multiple sets of said plurality of receiver inputs over a plurality of said observation intervals from said plurality of iterations prior to coherent analysis.

11. The system of Claim 9 wherein said exciting waveform is a triangular waveform.

12. A system for locating a marker associated with a patient comprising:  
an excitation source for repetitively emitting an exciting waveform during an excitation interval, said exciting waveform causing said marker to resonate;  
a sensing array including a plurality of sensing coils, said sensing coils outputting a plurality of inputs during a observation interval; and  
a receiver for analyzing said plurality of inputs in a coherent manner.

13. The system of Claim 12 wherein said receiver averages multiple sets of said plurality of inputs over a plurality of said observation intervals prior to coherent analysis.

[c1] 14. A method for treating a patient that has a marker associated to the patient, comprising:

irradiating the patient with a radiation beam;  
sensing the marker to obtain position information related to an actual position of the marker using a receiver that uses coherent detection;  
determining an actual location of the treatment target based on the sensed position information of the marker; and  
controlling the radiation beam and/or movement of the patient automatically via a computer based on the actual position of the treatment target while sensing the marker.

[c2] 15. A method for treating a patient having a marker associated to the patient, the method comprising:

sensing the marker to obtain position information related to an actual position of the marker using a receiver that uses coherent detection;  
determining an actual location of the treatment target based on the sensed position information of the marker; and  
controlling a radiation beam for treating the patient and/or movement of the patient automatically via a computer based on the actual position of the treatment target while sensing the marker.

16. A system for locating a marker associated with a patient comprising:  
an excitation source for emitting an exciting waveform at a first frequency, said exciting waveform causing said marker to resonate at a second frequency;  
a sensing array including a plurality of sensing coils, said sensing coils outputting a plurality of inputs indicative of a magnetic flux from said resonating marker; and  
a receiver for analyzing said plurality of inputs in a coherent manner.